

## Structures, Processes, and Responses in Animals

### 6-3 The student will demonstrate an understanding of structures, processes, and responses in animals that allow them to survive and reproduce. (Life Science)

#### 6.3.4 Explain how environmental stimuli cause physical responses in animals (including shedding, blinking, shivering, sweating, panting, and food gathering).

**Taxonomy level:** 2.7-B Understand Conceptual Knowledge

**Previous/Future knowledge:** In 3<sup>rd</sup> grade (3-2.4), students explained how changes in habitats affect the survival of plants and animals. In 4<sup>th</sup> grade (4-2.5), students explained how an organism's behavior is related to its environment.

**It is essential for students to** know that animals have physical responses that are caused by environmental stimuli. Examples of animal responses to temperature changes that help maintain internal temperature include:

##### *Shedding*

- To maintain internal temperatures, animals may form thick coats of fur or feathers to insulate their body from cold weather; in hot weather animals will shed this extra covering, providing a cooling effect.

##### *Sweating*

- Sweating is an organism's major way of getting rid of excess body heat.
- When sweat evaporates from the surface of the skin, it cools the animal.

##### *Panting*

- Panting is another way of getting rid of excess body heat.
- When an animal pants (breathes heavily), increased air flow causes an increase in evaporation from the animal's mouth and lungs, cooling the animal. -

##### *Shivering*

- Shivering is a mammal's mechanism to increase heat production.
- Shivering is an involuntary response to a drop in the temperature outside or within the body.
- It is a method that the body uses to increase the rate at which energy is transformed into heat.

Examples of common responses to changes in environmental stimuli include:

##### *Blinking*

- Blinking is an automatic response that helps to protect the eye.
- Some animals need to blink to keep their eyes covered with a tear film.
- This tear film serves to protect the eye from drying out and from potential infection.
- The blink response also serves to protect the eye from being injured if a foreign object comes near the eye.

##### *Food gathering*

- The process of finding food by hunting or fishing or the gathering of seeds, berries, or roots, may be seasonal.
  - *Storing food:* Many animals will begin to gather and store food for the winter. Examples of such animals may be squirrels, mice, or beavers.

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- *Storing nutrition in the form of fat:* Many animals will overeat and reduce their physical activity to conserve energy in response to environmental stimuli such as cold weather or drought. Examples of such animals may be bears, penguins, walruses, chipmunks, or ants.

**It is not essential for students to** know the chemical mechanisms for the responses studied here.

#### **Assessment Guidelines:**

The objective of this indicator is to *explain* how environmental stimuli cause physical responses in animals; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the various physical responses that animals have due to environmental stimuli.

However, appropriate assessments should also require students to *recall* physical responses of various animals; *summarize* responses that occur due to environmental stimuli; or *exemplify* ways that the environment affects animals.